

NOTES ON THE DISTRIBUTION, HABITS, AND  
HABITATS OF SOME PANAMA CULICINES  
(DIPTERA: CULICIDÆ)

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(Continued from Vol. 55, p. 200)

In the first part of this paper I discussed the distribution, habits and habitats of some Panama Anophelines. In this part I am continuing with the Panama Culicines, *Uranotænia* thru *Deinocerites*.

PART II

*Uranotæniini*

*Uranotænia* Lynch Arribalzaga

*Uranotænia calosomata* Dyar & Knab

*Uranotænia calosomata* Dyar & Knab, Jour. N. Y. Ent. Soc., 15: 200, 1907 (Type Loc.: Tabernilla, C. Z.).

*Distribution*:—Tabernilla (Busek); Culebra (Army Medical Museum); Paja (Shropshire); La Chorrera (Author).

*Habits and Halitats*:—The larvæ breed in shady, swift flowing streams, associated with *Chagasia bathanus*. This is a rare species collected only in March. (Bred from larvæ in prints of horse's feet containing water—Busek. Ground pools and often in cattle tracks—Dyar).

*Uranotænia coatzacoalcos* Dyar & Knab

*Uranotænia coatzacoalcos* Dyar & Knab, Jour. N. Y. Ent. Soc., 14: 186, 1906.

*Uranotænia typhlosomata* Dyar & Knab, Jour. N. Y. Ent. Soc., 15: 200, 1907. (Type Loc.: Tabago Island, R. de P.) (Var. *coatzacoalcos* D. & K., *vide* Dyar & Shannon, Ins. Ins. Mens., 12: 191, 1924.) (Syn. *coatzacoalcos* D. & K., *vide*, Dyar, Ins. Ins. Mens., 13: 185, 1925.)

*Distribution*:—Pedro Miguel (Jennings); Gatun (Zetek); Barro Colorado Island (Shannon); Caldera Island, Tabago Island

(Jennings); Gamboa, National Forest, La Chorrera, El Valle de Anton (Author).

*Habits and Habitats*:—Larvæ breed in rock pools, streams and once collected in water in a fallen log. This species is a shade breeder, without vegetation, but debris may be present. It is not collected in flowing water.

This species breeds throughout the year associated with *Anopheles eiseni*, *A. punctimacula* and *A. apicimacula*.

Adults have been captured flying in the jungle near the breeding pool.

*Uranotænia geometrica* Lutz

*Uranotænia geometrica* Lutz (in Theobald), Mon. Cul., 2: 247, 1901.

*Distribution*:—Empire, Gatun, Culebra (Busck); Cartagenita, La Boca, Ancon, Pedro Miguel, Corozal, Gorgona, Gatun, Tabernilla (Jennings); Caño (Zetek); Paraiso (Dunn); Toro Point, Gold Hill, Summit, Margarita, Mindi, Monte Lirio, Miraflores, Las Cascades, Partilla, Mount Hope, Majagual, La Pita, Comacho, Cativa, Mandinga (Shropshire); Caño Saddle (Dyar & Shannon); Panama (Zetek); Tabago Island (Jennings); Empire, La Chorrera (Author).

*Habits and Habitats*:—The larvæ breed in hoofprints, seepage areas, small streams, swamps, rock pools and in floating river vegetation, always in the sun and with various types of vegetation. It is associated with *Anopheles* larvae of several species.

This is the common *Uranotænia* of La Chorrera. The adults have not been taken in the field.

*Uranotænia lowii* Theobald

*Uranotænia lowii* Theobald, Mon. Cul., 2: 339, 1901.

*Distribution*:—Las Cascades (Busck); La Boca, Culebra, Miraflores, Ancon (Jennings); Corozal (Zetek); Frijoles, Caño Saddle (Dyar & Shannon); Arenal River (Shropshire); Miraflores, La Chorrera, Rio Abajo, Old Panama (Author).

*Habits and Habitats*:—The larvæ breed in streams, swamps, pasture marshes, sand flats, seepage areas, ponds, pools and rock pools. They breed in sunny places with vegetation; water

segment, clear or foul. It is associated with several species of *Anopheles* larvæ.

The adults were not taken in the field. (Not known to bite—Dyar.)

This species breeds throughout the year. It is less common than *U. geometrica* but more generally distributed.

*Uranotænia pulcherrima* Lynch Arribalzaga

*Uranotænia pulcherrima* Lynch Arribalzaga, *Rev. Mus. La Plata*, 2: 165, 1891.

*Distribution*:—Panama (Dyar); Empire, Gamboa (Author).

*Habits and Habitats*:—The larvæ breed in floating river vegetation in *Najas* and *Pistia*. It is associated with *A. albimanus* and *triannulatus*.

The adults have not been taken in the field.

These four species of *Uranotænia* are all of the genus that are known from Panama with the exception of *Uranotænia hystera* Dyar & Knab, which is reported as a very rare species known only from a few females, and is unknown to the author.

*Megarhinini*

*Megarhinus* Robineau-Desvoidy

*Megarhinus hypoptes* Knab

*Megarhinus hypoptes* Knab, *Can. Ent.*, 29: 50, 1907.

*Megarhinus trinidadensis* Busek (nec D. & K.) *Smith Misc. Coll.*, 53: 60, 1908. (Syn. *hypoptes* Knab, *vide*, Howard, Dyar & Knab, *Carnegie Ins. Wash.*, Pub. 159, 4: 956, 1917.)

*Distribution*:—Tabernilla (Busek); Mount Hope, Ancon, Comacho (Shropshire); Caño Saddle, France Field (Dyar & Shannon); Porto Bello (Busek); Chiva Chiva, Gamboa, La Chorrera, Old Panama (Author).

*Habits and Habitats*:—The larvæ are tree hole breeders. They are predaceous.

Adults have been collected on leaves in the jungle. The eggs are laid singly on the edge of tree holes.

The pupæ are distinctive from the other mosquitoes by the large size.

(Larvæ breed in bamboo—Dyar.)

*Megarhinus moctezuma* Dyar & Knab

*Megarhinus moctezuma* Dyar & Knab, Smith. Misc. Colls., Quar. Iss., 48: 251, 1906.

*Distribution*.—La Boca (Busck); Ancon, Miraflores (Jennings); Panama (Zetek); Old Panama (Author).

*Habits and Habitats*.—The larvæ breed in tree holes. (Gord husks—Dyar). They are predaceous.

Adults were not seen in the field.

*Megarhinus superbus* Dyar & Knab

*Megarhinus superbus* Dyar & Knab, Smith. Misc. Colls., Quar. Iss., 48: 255, 1906.

*Distribution*.—Tabernilla (Busck); Majagual, Porto Grande (Shorpshire); Caño Saddle (Dyar & Shannon); Fort Randolph (Baker); Piña (Author).

*Habits and Habitats*.—The larvæ breed in leaf bracts of wild pineapple and are predaceous. (Bromeliads—Dyar.)

The adults may be recognized in the field by the bright red abdominal hair tufts.

These three species are the only *Megarhinus* so far recorded from Panama.

*Culicini**Culex* Linnæus

There are no really satisfactory keys to the species of *Culex* found in Panama. The keys, descriptions and figures in Dyar's *Mosquitoes of the Americas* are not altogether trustworthy (Komp, 1935), and of course there are many new descriptions since Dyar's work, making it necessary to refer to the original papers. These papers are widely scattered throughout the literature. Until all the types are studied and new accurate drawings are made, this genus will remain relatively unknown even though some of its members are very well known. It is the largest genus represented in Panama in both species and probably in individuals, with the exception of some of the major pest mosquitoes such as *Mansonia* spp. and *Aedes taeniorhynchus* or *Anopheles* spp.

*Culex*, subgenus *Culex* sens. str.

*Culex chidesteri* Dyar

*Culex chidesteri* Dyar, Ins. Ins. Mens., 9: 117, 1921. (Type Loc.: Colon, R. de P.)

*Distribution*.—Colon (Chidester); La Chorrera (Author).

*Habits and Habitats*.—The larvæ breed in open sunny swamps, in deeply shaded pools and in slow flowing streams with floating debris. It apparently has rather diversified breeding habits. It appears to be uncommon, but it is difficult to identify, and may prove to be quite common.

No adults were identified in any material collected.

*Culex corniger* Theobald

*Culex corniger* Theobald, Mon. Cul., 3: 173, 1903.

*Culex lactator* Dyar & Knab, Jour. N. Y. Ent. Soc., 14: 206. (Syn. *corniger* Theobald, *vide*, Howard, Dyar & Knab, Carnegie Ins. Wash., Pub. 159, 3: 240, 1951.)

*Culex lactator loquaculus* Dyar & Knab, Smith. Misc. Colls., Quar. Iss., 52: 254, 1908. (Type Loc.: Canal Zone.) (Syn. *corniger* Theobald, *vide*, Howard, Dyar & Knab, Carnegie Ins. Wash., Pub. 159, 3: 240, 1915.)

*Distribution*.—Tabernilla, Las Cascades, Pedro Miguel, Lion Hill, Gatun (Busek); Culebra, Empire, Ancon (Jennings); Fort Sherman, Frijoles, Corozal (Zetek); Mindi, Gold Hill, Golden Green, Mount Hope, Monte Lirio, Coco Solo, Cativa, Majagual, La Pita, Cerro Gordo, Paja, Fort Randolph, Toro Point, Bella Vista, Margarita, Flemenco Island, Lirio Mill (Shropshire); Fort Davis, Fort Amador (Baker); Caldera Island (Jennings); Panama (Zetek); Chiriqui (Dunn); Chiva Chiva, Fort Clayton, La Chorrera, Rio Abajo, Jaun Diez, Old Panama, Lagarto (Author).

*Habits and Habitats*.—The larvæ breed in pools, hoofprints, pasture marshes, coconut shells, bamboo joints, rock holes, stump holes and root holes. (Barrels, tin cans, rotten banana trunk, water tub, hollow tree stump—Busek.) Usually found in shady places but it will breed in the sun. It was never found in flowing water and seldom in water in which vegetation is present. The body of water in which it breeds is always small and

of a temporary nature. It breeds throughout the year and is very common.

The eggs are laid in typical "culex" egg rafts.

The adults were never taken in trap collections.

*Culex coronator* Dyar & Knab

*Culex coronator* Dyar & Knab, Jour. N. Y. Ent. Soc., 14: 215, 1906. *Culex ousqua* Dyar, Ins. Ins. Mens., 6: 99, 1918. (Type Loc.: Panama.) (Var. *coronator* Dyar & Knab, *vide*, Dyar, Ins. Ins. Mens., 10: 18, 1922; listed as syn. *coronator* Dyar & Knab, *vide*, Dyar, Ins. Ins. Mens., 11: 172, 1923.)

*Culex usquatissimus* Dyar, Ins. Ins. Mens., 10: 19, 1922. (Described as a form of *coronator*; listed as syn. *coronator* Dyar & Knab, *vide*, Dyar, Ins. Ins. Mens., 11: 175, 1923.)

*Distribution*:—Pedro Miguel, Culebra, Bohio, Tabernilla, Las Cascades, Alejuela (Busck); Corozal, Gatun, La Boca, Ancon (Jennings); Paraiso, Mount Hope (Zetek); Sabanas, Coco Solo, Mindi, Gold Hill, Mandingo, Piatella, Majagual, Torro Point, Empire, Cativa, Paja, Comacho (Shropshire); Culebra (Dunn); Panama, Chagres River, Tabago Island (Busck); Porto Bello, Caldera Island (Jennings); Chiriqui (Dunn); Pedro Miguel, Gamboa, Chiva Chiva, Fort Clayton, La Chorrera, Rio Abajo, Old Panama, Piña, Lagarto (Author).

*Habits and Habitats*:—The larvæ of this species breeds in rock pools, hoofprints, swampy pastures, pools, seepage areas, potholes, streams (sluggish), marshes, road ruts, cement drains, coconut shells, rowboats, occasionally in tree holes and artificial containers. (Stagnant foul pool, rain barrel, hoofprints, streams, still shady pool, tank, rain pool, and old boat—Busck.)

This is probably the most common *Culex* in Panama. It breeds in many different situations and the breeding site may be sunny or shady. They seem to show little preference. It is seldom found in flowing water, but may be found in either fresh or foul water with or without vegetation. It is common throughout the year.

Adults are taken in horse traps, but there are no records of it biting man.

*Culex declarator* Dyar & Knab

*Culex declarator* Dyar & Knab, Jour. N. Y. Ent. Soc., 14: 211, 1906.

*Culex inquisitor* Dyar & Knab, Jour. N. Y. Ent. Soc., 14: 211, 1906. (Syn. *declarator* Dyar & Knab, *vide*, Dyar, Ins. Ins. Mens., 6: 97, 1918.)

*Culex jubilator* Dyar & Knab, Jour. N. Y. Ent. Soc., 14: 211, 1906. (Type Loc.: Panama). (Syn. *declarator* Dyar & Knab, *vide*, Dyar Ins. Ins. Mens., 6: 97, 1918.)

*Culex proclamitor* Dyar & Knab, Jour. N. Y. Ent. Soc., 14: 211, 1906. (Var. *declarator* Dyar & Knab, *vide*, Dyar, Ins. Ins. Mens., 6: 97, 1918.) (Syn. *declarator* Dyar & Knab, *vide*, Dyar, Ins. Ins. Mens., 9: 196, 1921.)

*Culex revelator* Dyar & Knab, Jour. N. Y. Ent. Soc., 15: 202, 1907. (Type Loc.: Tabago Island, R. de P.) (Syn. *declarator* Dyar & Knab, *vide*, Dyar, Ins. Ins. Mens., 6: 97, 1918.)

*Distribution*.:—Pedro Miguel, Gatun, Rio Chagres (Busek); Paraiso, Las Cascadas (Jennings); Ancon (Dunn); Bas Obispo (Zetek); Toro Point, Mindi, Monte Lirio, Miraflores, Cativa, Gold Hill, Las Cascades, Golden Green, Sweetwater, Cerro Gordo, Mandingo, Cardenas River, Paja, Gold Hill, Bella Vista Margarita, Culebra, Empire, Comacho (Shropshire); Fort Randolph (Baker); Casejal River, Tabago Island (Jennings); Chiriqui (Dunn); Gamboa, Pedro Miguel, Chiva Chiva, Fort Clayton, National Forest, La Chorrera, Rio Abajo, Jaun Diez, Old Panama, Lagarto (Author).

*Habits and Habitats*.:—The larvæ breed in swamps, rock pools, foul pools, cement drains, pasture marshes, stump holes, tree holes, coconut shells, palm spathes. This species breeds in a variety of places, either sunny or shady, usually without vegetation and often in foul water. "Tree hole" breeding is as common as terrestrial breeding. The species is fairly common, but no adults were taken. Egg rafts were collected in stump holes. It breeds mainly during the rainy season. (Does not bite—Dyar.)

*Culex quinquefasciatus* Say

*Culex quinquefasciatus* Say, Jour. Ac. Nat. Sc. Phila., 3: 10, 1823.

*Culex fatigans* Wiedemann, Aussereurop. Zweifl. Ins., 1: 10, 1828. (Syn. *quinquefasciatus* Say, *vide*, Dyar & Knab, Proc. Ent. Soc. Wash., 11: 34, 1909.)

*Distribution*.—Ancon, Tabernilla, Las Cascadas (Busek; Corazal (Jennings); Miraflores, Pedro Miguel, Gatun, Balboa (Zetek); Empire, Margarita (Shropshire); Fort Davis (Baker); Cocoli Camp (Jennings); David (Zetek); Jaun Diez, La Chorrera (Author).

*Habits and Habitats*.—The larvae breed in foul sunny pools with floating debris. (Largely in artificial containers—Dyar.)

Adults were collected in native houses at the seashore.

This species seems to be uncommon on the Isthmus of Panama.

*Culex inflectus* Theobald

*Culex inflectus* Theobald, Mon. Cul., 2: 115, 1901.

*Culex extricator* Dyar & Knab, Jour. N. Y. Ent. Soc., 14: 211, 1906. (Probably syn. *inflectus* Theobald, *vide*, Bonne-Wepster & Bonne, Ins. Ins. Mens., 9: 18, 1921; syn. *inflectus* Theobald, *vide*, Dyar, Ins. Ins. Mens., 9: 30, 1921.)

*Distribution*.—Corozal, Ancon (Jennings); Paraiso (Zetek); Fort Sherman (Dunn); Torro Point, Majagual, Cativa, Gold Hill, Margarita, Balboa, Empire, (Shropshire); Fort Randolph (Dyar & Shannon); Fort Davis (Baker); Colon (Busek & Chidester); Caldera Island (Jennings); Piña (Army Medical Museum); Chiriqui (Dunn); Piña (Author).

*Habits and Habitats*.—The larvæ breed in crab holes. Rarely in dirty receptacles (Dyar). Breeding may take place in old tin cans and in hollow logs. It is associated with *Trichoprosopon digitatum* in tin cans and with *Hæmagogus lucifer* in logs (Dunn).

(The adults do not bite—Dyar.)

This appears to be one of the rarest *Culex*, subgenus *Culex* of those found in Panama.



*Culex interrogator* Dyar & Knab

*Culex interrogator* Dyar & Knab, Jour. N. Y. Ent. Soc., 14: 209, 1906. *Culex reflector* Dyar & Knab, Smith. Misc. Colls., Quar. Iss., 52: 256, 1908. (Type Loc.: Ancon, C. Z.) (Syn. *interrogator* Dyar & Knab, *vide*, Dyar, Ins. Ins. Mens., 11: 176, 1923.)

*Distribution*.—Paraiso, Ancon (Jennings); Empire, La Boca, Tabernilla (Busck); Tabago Island (Busck); Old Panama, La Chorrera, Juan Diez (Author).

*Habits and Habitats*.—The larvæ breed in foul pools and wheel ruts. They are always in foul water, sunny, stagnant and with little or no vegetation. (Clear ground pools and tree holes—Dyar; Old boat, rain barrel, stagnant pools—Busck.)

Adults were not taken in trap collections.

This species is collected during the rainy season; uncommon.

*Culex mollis* Dyar & Knab

*Culex mollis* Dyar & Knab, Proc. Biol. Soc. Wash., 19: 171, 1906.

(First treated as a sp., *vide*, Howard, Dyar & Knab, Carnegie Ins. Wash., Pub. 159, 3: 267, 1915.)

*Culex carmodyiæ* Dyar & Knab, Jour. N. Y. Ent. Soc., 14: 210, 1906. (Distinct from *mollis* Dyar & Knab, *vide*, Dyar & Knab, Proc. Biol. Soc. Wash., 19: 171, 1906; syn. *nigripalpis* Theobald, *vide*, Dyar, Ins. Ins. Mens., 9: 28, 1921.)

*Culex equivocator* Dyar & Knab, Jour. N. Y. Ent. Soc., 15: 203, 1907. (Syn. *mollis* Dyar & Knab, *vide*, Dyar, Ins. Ins. Mens., 9: 28, 1921.)

*Culex elocutilis* Dyar & Knab, Smith. Misc., Colls., Quar. Iss., 52: 255, 1908. (Type Loc.: Porto Bello Bay, Panama.) (Syn. *mollis* Dyar & Knab, *vide*, Dyar, Ins. Ins. Mens., 9: 28, 1921.)

*Culex delys* Howard, Dyar & Knab, Carnegie Ins. Wash., Pub. 159, 3: 317, 1915. (Type Loc.: Tabernilla, C. Z.) (Syn. *mollis* Dyar & Knab, *vide*, Dyar, Ins. Ins. Mens., 9: 28, 1921.)

*Culex lepostenis* Dyar, Ins. Ins. Mens., 11: 70, 1923. (Syn. *mollis* Dyar & Knab, *vide*, Komp, Proc. Ent. Soc. Wash., 37: 10, 1935.)

*Distribution*:—Tabernilla, Ahorea Lagarto, Lion Hill (Busek); San Pablo (Jennings); Paraiso (Zetek); Comacho, Sweetwater, Miraflores, La Pita, Majagual, Toro Point, Paja, Fort Randolph, Margarita (Shropshire); Barro Colorado Island (Dyar & Shannon); Caldera Island, Cascajal River (Jennings); Colon (Busek); Caño (Zetek); Bruja, Army Medical Museum); Empire, Gamboa, National Forest, Chiva Chiva, Fort Clayton, La Joya, La Chorrera (Author).

*Habits and Habitats*:—The larvæ breed in tree holes, jungle streams, drains, swamps, pools, rock holes, fallen logs, small ponds (Bromeliads—Jennings). Found in a variety of places, this species is most abundant in rock holes, in shade, but also in the sun. Water is usually clear and wanting vegetation. (Bamboo trunk, water foul—Busek.)

The adults were not collected in traps.

*Culex nigripalpus* Theobald

*Culex nigripalpus* Theobald, Mon. Cul., 2: 322, 1901.

*Culex factor* Dyar & Knab, Jour. N. Y. Ent. Soc., 14: 212, 1906. (Syn. *nigripalpus* Theobald, *vide*, Dyar, Ins. Ins. Mens., 9: 28, 1921.)

*Culex regulator* Dyar & Knab, Jour. N. Y. Ent. Soc., 14: 213, 1906. (Syn. *nigripalpus* Theobald, *vide*, Dyar, Ins. Ins. Mens., 9: 28, 1921.)

*Culex carmodyiae* Dyar & Knab, Jour. N. Y. Ent. Soc., 14: 210, 1906. (Syn. *nigripalpus* Theobald, *vide*, Dyar, Ins. Ins. Mens., 9: 28, 1921.)

*Distribution*:—Ancon, Paraiso, La Boca (Jennings); Pedro Miguel (Zetek); Balboa, Corozal, Gatun, Culebra, Rio Grande, Monte Lirio, La Pita, Sweetwater, Toro Point, Margarita, Flemenco Island, Empire, Coco Solo (Shropshire); Colon, (Zetek); Tabago Island (Jennings); Rio Chagres (Busek); Chiva Chiva, Fort Clayton, Old Panama, Rio Abajo, Juan Diez (Author).

*Habits and Habitats*:—The larvæ breed in wheel ruts, pools, drains, pasture marshes and axils of palm fronds. Usually it breeds in foul water, either sunny or shady. Terrestrial, it is rarely in axils of leaves. Vegetation may be present or absent

in the habitat. (Old boat and tub—Jennings; clear swamps and coral pools—Dyar; Bromeliads—Busek.)

Adults were not taken in trap collecting, but they will bite humans.

Uncommon.

Subgenus *Melanoconion* Theobald

*Melanoconion* Theobald, Mon. Cul., 3: 238, 1903. (Type: *Culex atratus* Theobald.)

*Culex aikenii* Aiken

*Gnophodeomyia aikenii* Aiken, Brit. Guiana Med. Ann., 60, 1906.

*Culex panacossa* Dyar, Ins. Ins. Mens., 11: 120, 1923. (Syn. *aikenii* Aiken, *vide*, Dyar, Ins. Ins. Mens., 13: 21, 1925.)

*Distribution*:—Bas Obispo (Shropshire); Empire (Author).

*Habits and Habitats*:—The larvæ breed in floating vegetation in the Rio Mandinga. It is collected from June to September. (Roots of *Pistia*—Dyar).

Rare.

*Culex bastigarius* Dyar & Knab

*Culex bastigarius* Dyar & Knab, Proc. Biol. Soc. Wash., 19: 170, 1906.

*Culex cuelyx* Dyar & Shannon, Ins. Ins. Mens., 12: 48, 1924. (Type Loc.: Fort Clayton, C. Z.) (Syn. *bastigarius* Dyar & Knab, *vide*, Komp. Proc. Ent. Soc. Wash., 37: 7, 1935.)

*Culex xivilis* Dyar, Ins. Ins. Mens., 9: 78, 1920. (Syn. *bastigarius* Dyar & Knab, *vide*, Komp. Proc. Ent. Soc. Wash., 37: 7, 1935.)

*Distribution*:—Fort Clayton (Shannon); La Chorrera (Author).

*Habits and Habitats*:—The larvæ are found only in slow flowing streams, with vegetation, sunny. It is collected in October. (Edge of streams—Dyar.)

*Culex chrysonotum* Dyar & Knab

*Culex chrysonotum* Dyar & Knab, Proc. U. S. Nat. Mus., 35: 57, 1908. (Type Loc.: Canal Zone.)

*Melanoconion theobaldi* Lutz (*in* Bour. Nom. Nud.) Mos.

Bras., 39, 1904. (Syn. *chrysonotum* Dyar & Knab, *vide*, Komp, Proc. Ent. Soc. Wash., 37: 7, 1935.)

*Distribution*:—Cartagenita, Ancon, Tabernilla, Miraflores (Jennings); Balboa, Gatun (Zetek); Empire, Gold Hill, Monte Lirio, Margarita, Mundi (Shropshire); Fort Clayton, Culabra (Baker); La Chorrera, Old Panama (Author).

*Habits and Habitats*:—The larvæ breed in pools, streams, seepage areas, potholes, pasture marshes and ponds. It breeds in sunny places usually in grassy vegetation, water flowing, sluggish or stagnant, but usually clear. Sometimes it will breed in foul water.

The eggs of this species are laid on grass or sedge in double rows about fifty to a row, about one inch above the surface of the water.

The adults are collected on screens in the evening. They may be recognized in the field by the golden pronotum. There are no records of it biting man. It is collected throughout the year, common.

*Culex conspirator* Dyar & Knab

*Culex conspirator* Dyar & Knab, Jour. N. Y. Ent. Soc., 14: 217, 1906.

*Culex dymathes* Dyar & Ludlow, Ins. Ins. Mens., 9: 47, 1921. (Type Loc.: Cativa, C. Z.) (Syn. *conspirator* Dyar & Knab, *vide*, Komp, Proc. Ent. Soc. Wash., 37: 4, 1935 and Dyar, Ins. Ins. Mens., 11: 69, 1923.)

*Culex fatuator* Dyar & Shannon, Ins. Ins. Mens., 12: 47, 1924. (Syn. *conspirator* Dyar & Knab, *vide*, Komp, Proc. Ent. Soc. Wash., 37: 5, 1935.)

*Distribution*:—Las Cascades (Jennings); Sweetwater, Cativa (Shropshire); Fort Clayton, Caño Saddle (Shannon); Barro Colorado Island (Dyar & Shannon); France Field (Baker); Pedro Miguel (Busck); Tabago Island, Rio Chagres (Busck); Gamboa, Empire, La Chorrera (Author).

*Habits and Habitat*:—The larvæ breed in shady rock pools. It is collected during the rainy season. (Ground pools and in root base pools, slow stream in grass—Dyar.)

Adults not collected in traps.

Uncommon.

*Culex dumni* Dyar

*Culex dumni* Dyar, Ins. Ins. Mens., 6: 123, 1918. (Type Loc.: Rio Mandinga, C. Z.)

*Culex ruffinis* Dyar & Shannon, Ins. Ins. Mens., 12: 143, 1924. (Type Loc.: Barro Colorado Is., C. Z.) (Syn. *dumni* Dyar, *vide*, Komp, Proc. Ent. Soc. Wash., 37: 8, 1935.)

*Distribution*.—Mandinga River (Dunn); Darian, Frijoles (Dyar & Shannon); Barro Colorado Island (Shannon); Far Fan (Curry); La Chorrera (Author).

*Habits and Habitats*.—The larvæ breed in sunny swamps and ponds having grass or sedge. (Bred from larvæ associated with *Pistia*—Dunn).

(Adults are not known to bite—Dyar.) Collected from June to December.

Uncommon.

*Culex eastor* Dyar

*Culex eastor* Dyar, Ins. Ins. Mens., 8: 71, 1920.

*Distribution*.—Gatun (Author). (Previously collected in this locality by W. H. W. Komp, but not published.)

*Habits and Habitats*.—The larvæ breed in ground pools. (Collected in a pool at the base of a fallen tree—Komp, *in litt.*)

Adults not taken in trap collections.

Collected in May. It is apparently rare.

*Culex educator* Dyar & Knab

*Culex educator* Dyar & Knab, Jour. N. Y. Ent. Soc., 14: 217, 1906.

*Culex apateticus* Howard, Dyar & Knab, Carnegie Ins. Wash., Pub. 159, 3: 331, 1915. (Type Loc.: Canal Zone.) (Syn. *pro parte educator* Dyar & Knab, *vide* Ins. Ins. Mens., 6: 106, 1918.)

*Culex aneles* Dyar & Ludlow, The Mil. Surg., 49: 63, 1922. (Type Loc.: Fort Clayton, C. Z.) (Syn. *educator* Dyar & Knab, *vide*, Dyar, Carnegie Ins. Wash., Pub. 387, 326, 1928.)

*Distribution*.—Cardenas, Majagual (Army Medical Museum); Gatun, Mindi (Shropshire); Pedro Miguel (Busek); Miraflores, Rio Grande, Tabernilla (Jennings); Gatun, Caño,

Fort Sherman, Quarry Heights, Fort Amador (Zetek); Fort Clayton, Barro Colorado Island (Shannon); Fort Randolph (Baker); Upper Pequini River (Jennings); Tabago Island (Zetek); La Chorrera (Author).

*Habits and Habitats*.—The larvæ breed in grassy pools and streams in the sun. It is collected from July to October.

No adults taken in trap collections.

Uncommon.

*Culex egcymon* Dyar

*Culex egcymon* Dyar, Ins. Ins. Mens., 11: 67, 1923. (Type Loc.: Tabernilla, C. Z.)

*Distribution*.—Tabernilla (Busck); Darien (Dyar & Shannon; Empire, La Chorrera (Author).

*Habits and Habitats*.—The larvæ breed in jungle streams, shady, devoid of vegetation. (Slowly running spring full of larvæ and small fish—Dyar; slow streams, in roots of *Pistia*—Dyar & Shannon.) Collected from May to September.

Adults were taken on screens in the evening.

Uncommon.

*Culex elevator* Dyar & Knab

*Culex elevator* Dyar & Knab, Jour. N. Y. Ent. Soc., 14: 217, 1906.

*Culex apateticus* Howard, Dyar & Knab, Carnegie Ins. Wash., Pub. 159, 3: 321, 1915. (Type Loc.: Canal Zone.) (Syn. *pro parte elevator* Dyar & Knab, *vide*, Dyar, Ins. Ins. Mens., 6: 106, 1918.)

*Culex curryi* Dyar. Ins. Ins. Mens., 14: 112, 1926. (Type Loc.: Mojinga Swamp, C. Z.) (Syn. *elevator* Dyar & Knab, *vide*, Komp, Proc. Ent. Soc. Wash., 37: 7, 1935.)

*Culex dornarum* Dyar & Shannon, Ins. Ins. Mens., 12: 46, 1924. (Type Loc.: Fort Sherman, C. Z.) (Syn. *elevator* Dyar & Knab, *vide*, Komp, Proc. Ent. Soc. Wash., 37: 5, 1935.)

*Distribution*.—Fort Clayton (Shannon); Barro Colorado Island (Dyar & Shannon); Fort Sherman (Shannon and Shropshire); Mojinga Swamp (Curry); Tabernilla (Busck); Caldera Island, Porto Bello (Jennings); Chagres River (Busck); Gamboa, Empire, La Chorrera (Author).

*Habits and Habitats*.—The larvæ breed in rock pools, rock holes, jungle streams, and one record of it in water in a fallen log. It breeds in the shade, usually in flowing water. It is common during the rainy season. (Ground pools, slow streams with leaves—Dyar.)

No adults taken in trap collections.

*Culex erraticus* Dyar & Knab

*Mochlostyrax erraticus* Dyar & Knab, Jour. N. Y. Ent. Soc., 14: 224, 1906.

*Culex leprincei* Dyar & Knab, Jour. N. Y. Ent. Soc., 15: 202, 1907. (Type Loc.: Canal Zone.) (Syn. *erraticus* Dyar & Knab, *vide*, King & Bradley, An. Ent. Soc. Am., 30: 345, 1937.)

*Culex trachycampa* Dyar & Knab, Can. Ent., 41: 101, 1909. (Syn. *leprincei* Dyar & Knab, *vide*, Dyar, Ins. Ins. Mens., 11: 119, 1923.)

*Distribution*.—Pedro Miguel, Tabernilla, Bas Obispo, Las Cascades, Empire, Culebra, (Busck); Balboa (Zetek); Gold Hill (Shropshire); Fort Clayton, Caño Saddle (Shannon); Fort San Lorenzo, Gamboa, Monte Lirio (Dyar & Shannon); Cardanas River (Baker); Panama (Zetek); Gamboa, Empire, La Chorrera (Author).

*Habits and Habitats*.—The larvæ breed in floating river vegetation or in pond vegetation, in the sun. Found in water lettuce and *Najas* beds, it is most abundant in *Najas* associated with *Anopheles albimanus* and *Aedeomyia squamipennis*. It is common throughout the year.

No adults taken in trap collections.

Subgenus *Isostomyia* Coquillett

*Isostomyia Coquillett*, U. S. Dept. of Agr., Bur. Ent., Tech. Ser., 11: 16, 1906. (Type: *Culex conservator* Dyar & Knab.)

*Culex conservator* Dyar & Knab

*Culex conservator* Dyar & Knab, Jour. N. Y. Ent. Soc., 14: 221, 1906.

*Culex bifoliatu*s Dyar, Ins. Ins. Mens., 10: 92, 1922. (Syn.

*conservator* Dyar & Knab, *vide*, Dyar, Carnegie Ins. Wash., Pub. 387, 345, 1928.)

*Distribution*:—Miraflores, Mandinga (Shropshire); Gatun (Curry); Empire, Barro Colorado Island, La Chorrera, Old Panama (Author).

*Habits and Habitats*:—The larvæ breed in tree holes. It is common during the rainy season.

No adults were taken in trap collections.

#### Subgenus *Mochlostyrax* Dyar & Knab

*Mochlostyrax* Dyar & Knab, Jour. N. Y. Ent. Soc., 14: 228, 1906 (Type: *caudelli* Dyar & Knab.)

#### *Culex hesitator* Dyar & Knab

*Culex hesitator* Dyar & Knab, Jour. N. Y. Ent. Soc., 15: 205, 1907. (Type Loc.: Las Cascadas, C. Z.)

*Distribution*:—Las Cascadas (Busck); Matachin (Zetek); La Chorrera (Author).

*Habits and Habitats*:—The larvæ are collected in sunny ponds in thick grass. (Small sunny streams—Dyar; Swampy stream—Busck.)

#### *Culex pilosus* Dyar & Knab

*Culex pilosus* Dyar & Knab, Jour. N. Y. Ent. Soc., 14: 224, 1906.

*Mochlostyrax cubensis* Dyar & Knab (nec Bigot), Jour. N. Y. Ent. Soc., 14: 223, 1906. (nom. nud. *agitator* Dyar & Knab, *vide*, Dyar & Knab, Jour. N. Y. Ent. Soc., 15: 100, 1907.)

*Culex agitator* Dyar & Knab, Jour. N. Y. Ent. Soc., 15: 100, 1907. (Syn. *floridanus* Dyar & Knab, *vide*, Dyar & Knab, Ins. Ins. Mens., 5: 180, 1917.)

*Culex floridanus* Dyar & Knab, Proc. Biol. Soc. Wash., 19: 171, 1906. (Listed as a syn. *pilosus* Dyar & Knab, *vide*, Dyar, Ins. Ins. Mens., 12: 186, 1924.)

*Distribution*:—Matachin, Gatun (Zetek and Shannon); France Field (Dyar & Shannon); Las Cascadas (Busck); Tabago Island (Busck); Cristobal, Juan Diez, La Chorrera, Old Panama (Author).



*Habits and Habitats*:—The larvæ breed in salt or fresh water in permanent bodies of water or streams. They will breed in the sun or in shade, in foul or in clear water. The breeding place is usually grassy. (Temporary surface pools with *Aedes* and *Psorophora*. In jungle pools—Dyar. In temporary rain pools and not in permanent water—Komp. Old boat and foul water in old machinery—Buseck.)

Common during the rainy season.

No adults taken. (Adults do not bite—Dyar.)

#### Subgenus *Lutzia* Theobald

*Lutzia* Theobald, Mon. Cul., 3: 155, 1903. (Type: *Culex bigoti* Bellardi.)

#### *Culex allostigma* Howard, Dyar & Knab

*Culex allostigma* Howard, Dyar & Knab, Carnegie Ins. Wash., Pub. 159, 3: 471, 1916. (Type Loc.: Panama.)

*Distribution*:—Ancon, San Pablo, Gatun, Tabernilla, Las Cascades (Buseck); Corozal, Pedro Miguel (Jennings); Fort Sherman (Zetek); Empire, Golden Green, Cerro Gordo, Majagual (Shropshire); Barro Colorado Island, France Field, Gamboa (Dyar & Shannon); Culebra, Fort Davis (Baker); Boca del Toro (Osterhout); Panama, Caldera Island (Jennings); Gamboa, Chiva Chiva, National Forest, La Chorrera (Author).

*Habits and Habitats*:—The larvæ breed in rock holes, drains, and small ponds. They may be found in the sun or in shade, without vegetation, water clear, but usually with fallen leaves and debris. (Artificial containers—Dyar.)

The eggs are laid in rafts. The pupæ are large, distinctive and very active. The larvæ when disturbed lie on the bottom of the shallow pool in mud and debris for long periods of time. The larvæ are predaceous on other mosquito larvæ and are found with *Culex mollis*, *Anopheles eiseni*, *A. punctimacula* and *A. apicimacula*.

There are many more species of *Culex* recorded in the literature as occurring in Panama, but these are unknown to the author. There are also species known from Panama, some of which are

apparently quite common, which have never been recorded. The following list are those species recorded in the literature, some of which are undoubtedly misidentifications: *Culex distinguendus* Dyar, *elaphas* Komp, *inhibitor* Dyar & Knab = *erraticus* Dyar?, *flabellifer* Komp, *iolambdis* Dyar, *jubifer* Komp, *latisquama* Coquillett, *limacifer* Komp, *menytes* Dyar, *mutator* Dyar & Knab, *opisthopus* Komp, *paracrybda* Komp, *phlogistus* Dyar, *plectoporce* Root, *psatharus* Dyar, *quadrifolius* Komp, *rooti* Roseboom, *serratimargo* Root, *spissipes* Theobald, *taeniopus* Dyar & Knab, *tecmarsis* Dyar, *vexillifer* Komp, *vomerifer* Komp, *zeteci* Dyar, *browni* Komp, *corriganii* Dyar & Knab, *alogistus* Dyar, *daumastocampa* Dyar & Knab, *imitator* Theobald, *jenningsi* Dyar & Knab, *bonnei* Dyar, *secunda* Bonne-Wepster & Bonne, *bigoti* Bellardi.

*Deinocerites* Theobald

*Deinocerites* Theobald, Mon. Cul., 2: 215, 1901. (Type: *cancer* Theobald.)

*Deinocerites cancer* Theobald

*Deinocerites cancer* Theobald, Mon. Cul., 2: 215, 1901.

*Deinocerites melanophylum* Dyar & Knab, Jour. N. Y. Ent. Soc., 15: 200, 1907. (Type Loc.: Colon, R. de P.) (Listed as syn. *cancer* Theobald, *vide*, Dyar, Carnegie Ins. Wash., Pub. 387, 1928.)

*Deinocerites monospathus* Dyar, Ins. Ins. Mens., 13: 155, 1923. (Type Loc.: Fort Sherman, C. Z.) (Listed as *aber. cancer* Theobald, *vide*, Edwards, Genera Insectorum, fasc. 194, 222, 1932.)

*Distribution*.—La Boca (Busck); Fort Davis (Baker); Fort Randolph, France Field, Fort Sherman (Baker and Zetek); Margarita, Majagual, Toro Point (Shropshire); Boca del Toro (Rosenau); Colon (Busck); Caldera Island (Jennings); Fort Randolph (Author).

*Habits and Habitats*.—The larvæ breed in crab holes. (Adults do not bite humans—Dyar.)

*Deinocerites pseudus* Dyar & Knab

*Deinocerites pseudus* Dyar & Knab, Smith. Misc. Colls., Quar. Iss., 52: 260, 1909. (Type Loc.: Ancon, C. Z.)

*Distribution*.—Corozal, Miraflores, Ancon (Jennings); Monte Lirio (Army Medical Museum); Fort Sherman (Zetek); Toro Point, Cativa, Margarita (Shropshire); Panama (Dunn); La Chorrera, Rio Abajo, Old Panama (Author).

*Habits and Habitats*.—The larvæ breed in crab holes on the beach.

Adults are collected in horse traps and in houses. (Adults do not bite humans—Dyar.)

Common throughout the year.

There are two more species of *Deinocerites* recorded in the literature as occurring in Panama, but these are unknown to the author. They are: *D. epitedeus* Knab and *D. spanius* Dyar & Knab.

(To be continued)